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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/804,347	03/19/2004	John W. Hoard	81098595	7026

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EXAMINER

TRAN, DIEM T

ART UNIT	PAPER NUMBER
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3748

MAIL DATE	DELIVERY MODE
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05/14/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/804,347

Applicant(s)

HOARD ET AL.

Examiner

Diem Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION:

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 5, 10, 14, 19-21 is/are rejected.
- 7) ☐ Claim(s) 2-4, 6-9, 11-13, 15-18 and 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This office action is in response to the amendment filed on 3/2/07. In this amendment, claims 11, 12, 14, 22 is amended. Overall, claims 1-22 are pending in this application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 5, 10, 14, 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Balko et al. (US Patent 6,363,716) in view of Hoard et al. (US Patent 6,363,714).

Regarding claims 1, 5, 10, 14, 19, Balko discloses a method for diagnosing operation of a nonthermal plasma discharge device disposed in the exhaust of an internal combustion engine, comprising:

controlling the power of the plasma based on the concentration of the NO_x in the exhaust gas wherein said engine exhaust has a lean NO_x trap (15) disposed downstream of the nonthermal plasma discharge device (34)(see Figure 2, col. 9, lines 34-44, col. 12, lines 60-67, col. 13, lines 1-4, 35+); however, fails to disclose determining said nonthermal plasma discharge device being operating properly when a concentration of NO_x of exhaust gases exiting said lean NO_x trap increases in response to reducing power to the nonthermal plasma discharge device. Hoard teaches that higher energy deposition to the plasma device is commanded under

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conditions of high NOx production in the exhaust gas, and lower energy deposition to the plasma device is commanded while under lower NOx conditions (see col. 5, lines 14-20).

In Hoard, when a NOx concentration in the exhaust gas is increased, an applied power to the plasma reactor is increased in order to reduce more NOx in the exhaust gas to maintain the NOx concentration within a desired range. If the applied power is then reduced, the NOx concentration would increase above a desired range, therefore, it would have been obvious for one having ordinary skill in the art, to realize that the thermal plasma in the modified Balko is determined to work properly when tailpipe NOx concentration in the exhaust gases increases in response to reducing an applied power to the plasma reactor.

Regarding claim 20, Balko further discloses that said energy quantity is a fuel quantity supplied by said fuel injector (see col. 12, lines 60-62).

Regarding claim 21, Balko further discloses that said energy quantity is an electrical energy supplied by said power supply (see col. 12, lines 60-62).

Allowable Subject Matter

Claims 2-4, 6-9, 11-13, 15-18, 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed on 3/2/07 have been considered but they are not deemed persuasive. Applicant has argued that the nonthermal plasma discharge device (34) in Balko is not disposed in the exhaust of an internal combustion engine. The Examiner respectfully disagrees, since Balko discloses that a nonthermal plasma discharge device (34) is supplied with a carrier gas such as exhaust gas from an exhaust gas recirculation (EGR) system, wherein an EGR system is a part of an exhaust gas system of an internal combustion engine (see Figures 2, 5, col. 10, lines 14-25), therefore, the plasma device in Balko is disposed in the exhaust gas system of an internal combustion engine.

Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

Any inquiry concerning this communication from the examiner should be directed to Examiner Diem Tran whose telephone number is (571) 272-4866. The examiner can normally be reached on Monday -Friday from 8:00 a.m.- 6:00p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion, can be reached on (571) 272-4859. The fax number for this group is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 800-786-9199 (toll-free).

DT



Diem Tran
Patent Examiner
Art unit 3748



THOMAS DENION
SUPERVISORY PATENT EXAMINER
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